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TU-144 ON THE AIR LANES

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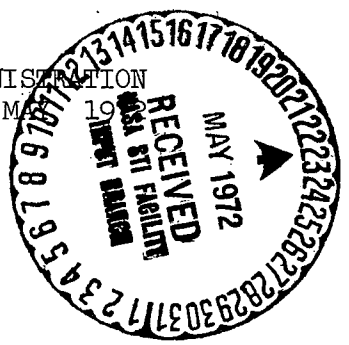

TU-144 ON THE AIR LANES

[Article by A. Kraminov; Moscow, Grazhdanskaya Aviatsiya, Russian, No 1, 1972, pp 16-17]

This can be said to be a collective interview. The participants in it were the famous aircraft designer, Academician, Twice Hero of Socialist Labor, Lenin and State Prize Laureate Andrey Nikolayevich Tupolev; his son, Chief Designer, Professor, State Prize Laureate Aleksey Andreyevich Tupolev; Honored Test Pilot of the USSR, Hero of the Soviet Union Mikhail Vasil'yevich Kozlov and Navigator First Class of the Central Administration of International Airlines of the Ministry of Civil Aviation Georgiy Nikolayevich Bazhenov. A discussion was held with them, jointly and singly, soon after the return of the Tu-144 from Bulgaria where it made a friendship visit. Thousands of residents of Sofia were familiarized with the airliner. The members of the Poliaical Bureau of the Central Committee of the Communist Party of Bulgaria headed by Comrade Todor Zhivkov wrote the following in the distinguished guest book:

"We are enraptured by this great achievement of Soviet science and engineering, the mind, talent and golden hands of Soviet scientists, designers, engineers, technical and industrial workers who created the modern air giant, the Tu-144."

This aircraft incorporating the latest achievements of Soviet aircraft construction was met in the same way, with great interest, in Prague, Berlin, Warsaw and, somewhat earlier, in Paris at the Twenty-ninth International Meeting on Aeronautics and Outer Space.

"Special attention was paid by the specialists," said Navigator G. N. Bazhenov. "They questioned us in detail about the structural design, instruments and automation."

"Of course, they ask about the control system," continued M. V. Kozlov. "On our aircraft the automation is a theoretically new four-channel system. All the channels operate simultaneously. If one of them generates a false signal, the aircraft does not react to it. It orients on the valid signals. Even on failure of two channels simultaneously, favorable completion of the flight is guaranteed.

We talk about speed. Isn't it enticing -- three hours from Moscow to Khabarovsk?! And it is possible to return the same evening of the departure. Let us say that you take off on the 1st of January in the Far East and land in the capital (considering the difference in the time zone) still in the old year -- 31 December.

Someone joked that the Tu-144 will confuse relations between the people sent on business trips and the bookkeepers.

Aleksey Andreyevich Tupolev was not joking:

"Talk. But, nevertheless, it will be necessary to become accustomed to such speed."

The general and chief designers agreed that even for them the speeds of this new aircraft were not unexpected, but, nevertheless, astonishing.

Andrey Nikolayevich, who flew the Tu-144 from Moscow to Sofia recalled:

"To tell the truth, I was worried -- but we were to make the first supersonic flight on an Aeroflot route which was, as one might think, connected with certain difficulties." However, only a little more than an hour passed and the ship's commander Eduard Vaganovich Yelyan reported by telephone: "The trip went according to plan."

"When the aircraft, on its way home, took off from Sofia Airport," said A. A. Tupolev, "I and the Bulgarian comrades headed for the airport building. When we entered the building, they reported to us that the Tu-144 had already crossed the USSR border. On climbing to the upper level, we received a new report -- the aircraft was over Kiev. We started to sit down in the car to drive into town and they reported to us: "The aircraft just landed in Moscow."

The trip took exactly 71 minutes. For 53 minutes the Tu-144 flew at a cruising speed of 2,300 km/hr, almost twice the speed of sound. It flew at an altitude of 16,000 meters.

For the Tu-144 following the route of subsonic aircraft, the number of stations with which (in accordance with air traffic rules) it was required to maintain radio communications turned out to be too large. After failing to contact one zone, the crew hastened to switch to another, and some were skipped altogether. Indeed, the route was inconvenient for a supersonic aircraft: too many breaks and turns.

"Everything is understandable," said Andrey Nikolayevich Tupolev. "We envisioned our aircraft as a theoretically new pioneering aircraft. When piston aircraft were replaced by jet aircraft, the "ground" was reorganized to a significant extent. With the arrival of supersonic planes, this must be done again."

And what about the crew? How does it contrive to control the aircraft at such sharply increased speeds? This is relatively easy because the crew is

helped by a variety of automation. The improved automatic pilot and onboard computer maintain the prescribed course. The navigator looks at a screen to see where the aircraft is located and how many kilometers remain to the destination. He obtains all the required operating information. The flight and landing are realized completely automatically.

Here, it is appropriate to mention that the cost of the electronic equipment on the Tu-144 is about half the cost of the entire aircraft.

"And what is there left for the crew to do?" I asked Koslov.

He threw up his hands.

"During testing we can "invent" work. Our flight engineers Vladimir Mikhaylovich Benderov and Yuriy Vasil'yevich Seliverstov are busy with throwing out all possible "charades" for Yelyan and me. What else to do -- I'm at my wit's end!"

"Of course, Mikhail Vasil'yevich is pulling your leg," interrupted the chief designer. "The more complicated the aircraft, the more important the role of the crew. A pilot's or navigator's skill, being only an excellent pilot is not enough. Let the equipment have maximum reliability, but the crew must always be on the alert. In case of a failure, they must know how to orient themselves instantaneously and correctly, to shut down the automation and take control of the aircraft."

"Such saturation of an aircraft with specialized equipment as on the Tu-144," said Kozlov seriously, "requires definite psychological adjustment on the part of the pilots. This adjustment is similar to the one which took place during the period of transition from visual to instrument flying. As I understand it, at that time some pilots were unable for a long time to adjust and fly the aircraft exclusively by instruments."

"How will the passengers feel?"

"Exactly the same as in modern multiplace aircraft," answered Navigator G. N. Bazhenov. "Perhaps even better. The automation regulates the pressure gradient in the passenger cabin smoothly; therefore, the ears do not plug up. The breaking of the sound barrier is absolutely unnoticeable. On echelon, the aircraft flies smoothly, without vibration and almost noiselessly. The passenger cabin is very comfortable. To feed the air passengers on a short trip, the stewardesses pass out packaged meals."

The Tu-144 does not require super long or especially reinforced landing strips. It is entirely suited to the same airports which take the Tu-104, Tu-154 and Il-62. In Warsaw, for example, it landed freely on a 2,300 meter strip.

Nevertheless, when servicing this aircraft, the technical services of the airports and the transportation people must be a bit more efficient in order not to keep it on the ground an excessive amount of time. Their work is facilitated by the onboard monitoring system for all the vitally important

structural units and special equipment recording the slightest maladjustments in flight.

On concluding the conversation, Andrey Nikolayevich Tupolev stated that the collective of the design office which he heads is doing everything possible to speed up the time of beginning regular operation of the Tu-144 supersonic aircraft on the domestic and international Aeroflot lines.